User's Manual

Models CD5220 / CD6220

Vacuum Fluorescent Customer Display



CD5220 customer display

INDEX

1. FEATURES 3

2. TYPE CLASSIFICATION.. 4

3. GENERAL SPECIFICATIONS.. 5

4. INTERFACE SPECIFICATIONS 6

5. FUNCTION SELECTION 9

6. COMMAND.. 10

7. CHARACTER SET 16

8. INSTALLATION GUIDE.. 21

CD5220 customer display

1. FEATURES

- 40 Characters (20 columns x 2 lines).
- Easy to read blue-green fluorescent color and large characters.
- Adjustable viewing angle of 8-35° and rotation angle of 270°.
- Two segment poles provide 4 adjustable heights.
- DIP switch selectable emulation modes:
  CD5220 UTC AEDEX ADM787 ADM788 EscPOS DSP-800.
- User-defined characters can be downloaded.
  (CD5220, DSP-860, and EPSON command mode only)
- A code-generated software is provided for user to download own characters to the display (saving to EEPROM is an option).
- Selectable international character sets.
- User-defined message can be downloaded to display. (DSP-800 only)
- Display area can be controlled by window function. (EPSON only)
- Available in either RS-232C or Centronics interface. Selectable baud rates of 4800,9600 bps for RS-232C interface. An EEPROM option is available for setting from 300 to 19200 bps by software.
- A Pass-Through function is available which allows both printer and display to be connected to the same communication port.

2. TYPE CLASSIFICATION

CD5220	-	S	T	12	N	PT
I		II	III	IV	V	VI

No	*Type name*	*Type name*	*Description*
I	Mode No.	**CD5220**	CD5220 display
		CD6220	CD6220 display
II	Interface	**S**	Serial port (RS232C)
		P	Parallel port (Centronics)
III	Base section	**T**	Rectangle base
		C	Circular base
IV	Power input	**05**	5V DC
		12	12V DC
		24	24V DC
V	Power adapter	**N**	No adapter
		110	110V AC adapter
		EU	230V AC adapter with EU power core
		UK	230V AC adapter with EU power core
		B	Power bracket for PC
IV	Pass through function	**PT**	With pass through function
			Without pass through function

3. GENERAL SPECIFICATIONS

NO	ITEM		CD5220	CD6220
1	Display method		Vacuum fluorescent display	
2	Number of character		40 characters (20 columns x 2 lines)	
3	Display color		Blue green	
4	Luminance		700 cd/m2	850 cd/m2
5	Character type		96 alphanumeric 13 international character set 1 user define character set	
6	Character font		5 x 7 dot matrix	
7	Character size		9mm x 5.25mm	11.2mm x 6.4mm
8	Character pitch		8.3mm	9.9mm
9	Power supply		5V DC / 12V DC / 24V DC	
10	Power consumption		5W / 4.5W / 4.5W	
11	MTBF-power on time		25000 hours	25000 hours
12	Dimensions (mm)	Panel	226(w) x 92(h) x 50(d)	260(w) x 100(h) x 64(d)
		Support	231 mm, 90 mm, 231+90 mm	
		Base	Rectangular: 217.5 (w) x 82 (h) x 106 (d) mm Circular: 50 (h) x 70 (r) mm	
13	Viewing angle		8 – 35 degrees	-5 – 35 degrees
14	Rotation angle		Maximum 270 degrees	
15	Weight		0.92 Kg	1.08 Kg
16	Environmental Conditions		Temperature Humidity Operating : 5 – 45 C -10 – 55 C Storage: 30% – 85% 30% – 85%	
17	Applicable Standards		FCC class A CE	

Table 3-1

4. INTERFACE SPECIFICATIONS

4.1. Communication

4.1.1. Serial port (RS232C) communication

(a) The interface specification are based on EIA RS232C baud rate 9600 or 4800 bps (selectable by DIP switch, refer Table 4-7) 8 data bits, no parity, 1 or more stop bits

(B) SERIAL PORT (RS232C) COMMUNICATION FLOW

1. Data flow : PC/host to display, display to printer, printer to PC/host
2. Control flow : DISPLAY TO PC/HOST, PRINTER TO DISPLAY, PC/HOST TO PRINTER

(c) CD5220/CD6220 will deactivate DTR or RTS signal to PC/host with following two conditions.

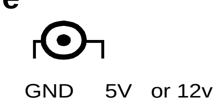
1. Printer deactivates DTR or RTS signal.
2. The pass through buffer in CD5220/CD6220 is full (200 bytes).

* If PC/host keeps transmitting the data to printer when CD5220/CD6220 deactivated DTR or RTS, data will be lost.

4.1.2 Serial port interface for circular base

A. Power connector

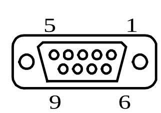
Connector type: DC jack (5.5 / 2.1)



B. RS232C interface to PC/HOST cable

PC/HOST side connector pin assignment

Connector type: D-sub 9 pin (Female)

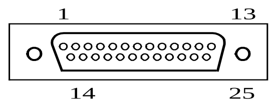


No	Signal	direction	Function description
1	FG	-	Frame ground
2	TXD	From printer to PC/Host	Printer status data
3	RXD	From PC/Host to display	Receive data
4	DSR	From PC/Host to printer	PC/Host ready signal
5	GND	-	Signal ground
6	DTR	From display to PC/Host	Display/printer ready signal
7	CTS	From PC/Host to printer	PC/Host ready signal
8	RTS	From display to PC/Host	Display/printer ready signal

Table 4-3

C. RS232C interface to printer cable

Printer side connector pin assignment



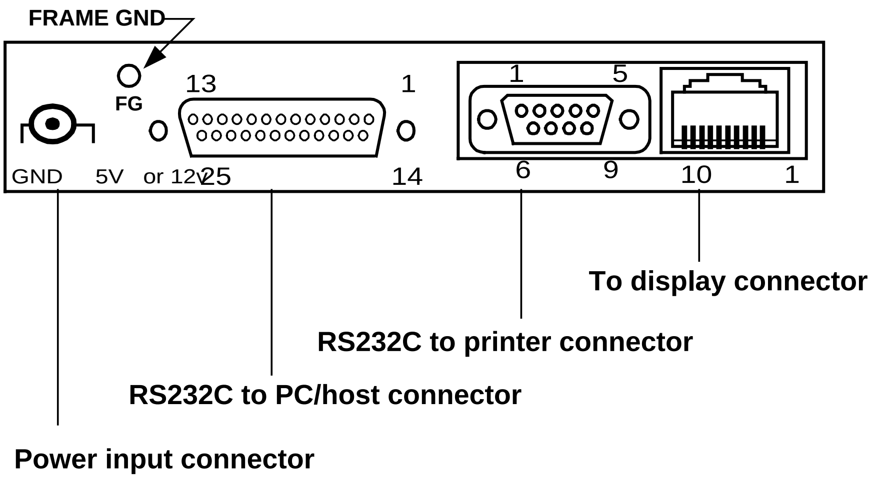
Connector type: D-sub 25 pin (Male)

No	Signal	direction	Function description
2	RXD	From printer to PC/Host	Printer status data
3	TXD	From display to printer	Transmit data
4	CTS	From printer to display	Printer ready signal
5	RTS	From PC/Host to printer	PC/Host ready signal
6	DTR	From PC/Host to printer	PC/Host ready signal
7	GND	-	Signal ground
20	DSR	From printer to display	Printer ready signal

Table 4-4

4.2 Serial port interface for rectangle basic section

A. Serial port interface connector position for rectangle basic section



B. Power input

Connector type: DC JACK (5.5/2.1)

C. RS232C to PC/HOST connector pin assignment

Connector type: D-sub 25 pin (Female)

No	Signal	direction	Function description
1	FG	-	Frame ground
2	TXD	From printer to PC/Host	Transmit data
3	RXD	From PC/Host to display	Receive data
4	RTS	From display to PC/Host	Ready to Send signal
5	CTS	From PC/Host to printer	Clear to Send signal
6	DSR	From PC/Host to printer	Data Set Ready signal
7	GND	-	Signal ground
16	V+	Input(optional)	If using external power
20	DTR	From display to PC/Host	Data Terminal Ready signal

Table 4-1

D. RS232C to printer connector pin assignment

Connector type: D-sub 9 pin (Male)

No	Signal	direction	Function description
2	RXD	From printer to PC/Host	Receive data
3	TXD	From display to printer	Transmit data
4	DTR	From PC/Host to printer	Data Terminal Ready signal
5	GND	-	Signal ground
6	DSR	From printer to display	Data Set Ready signal
7	RTS	From PC/Host to printer	Ready to Send signal
8	CTS	From printer to display	Clear to Send signal

Table 4-2

5. FUNCTION SELECTION

5.1 Baud rate

SW number SW1	Function description Baud rate(bps)
OFF	9600
ON	4800

Table 5-1

Notes: SW1 is ignored when the baud rate is stored to the EEPROM. Baud rate will be referred to the EEPROM baud rate status.

5.2 International character set

SW number				Function description	
SW2	SW3	SW4	SW5	International character set (code 20H-7FH)	Code table (code 80H-FFH)
OFF	OFF	OFF	OFF	U.S.A.	PC-437 (USA, standard Europe)
ON	OFF	OFF	OFF	FRANCE	PC-858(multilingual)
OFF	ON	OFF	OFF	GERMANY	PC-858(multilingual)
ON	ON	OFF	OFF	U.K.	PC-858(multilingual)
OFF	OFF	ON	OFF	DENMARK I	PC-858(multilingual)
ON	OFF	ON	OFF	SWEDEN	PC-858(multilingual)
OFF	ON	ON	OFF	ITALY	PC-858(multilingual)
ON	ON	ON	OFF	SPAIN	PC-858(multilingual)
OFF	OFF	OFF	ON	JAPAN	Katakana
ON	OFF	OFF	ON	NORWAY	PC-858(multilingual)
OFF	ON	OFF	ON	DENMARK II	PC-858(multilingual)
ON	ON	OFF	ON	SLAVONIC	
OFF	OFF	ON	ON	RUSSIA	
ON	OFF	ON	ON	Factory define	
OFF	ON	ON	ON	Factory define	
ON	ON	ON	ON	User define pattern	

Table 5-2

5.3 Command types

SW number			Function description	Software defined
SW6	SW7	SW8	Command type	Hex code
OFF	OFF	OFF	PTC	07
ON	OFF	OFF	UTC Standard	06
OFF	ON	OFF	UTC Enhanced	05
ON	ON	OFF	AEDEX	04
OFF	OFF	ON	ADM 787	03
ON	OFF	ON	ADM 788	02
OFF	ON	ON	ESC/pos	01
ON	ON	ON	DSP800	00

Table 5-3

6. COMMAND

6.1 PTC standard mode command list

Command	Code description(hex)	Function description
ESC DC1	1B 11	overwrite mode
ESC DC2	1B 12	vertical scroll mode
ESC DC3	1B 13	horizontal scroll mode
ESC Q A.........CR	1B 51 41 [n]x20 0D	set the string display mode, write string to upper line
ESC Q B.........CR	1B 51 42 [n]x20 0D	set the string display mode, write string to lower line
ESC Q D.........CR	1B 51 44 [n]xm 0D m<40	upper line message scroll continuously
ESC [D	1B 5B 44	move cursor left
BS	08	move cursor left
ESC [C	1B 5B 43	move cursor right
HT	09	move cursor right
ESC [A	1B 5B 41	move cursor up
ESC [B	1B 5B 42	move cursor down
LF	0A	move cursor down
ESC [H	1B 5B 48	move cursor to home position
HOM	0B	move cursor to home position
ESC [L	1B 5B 4C	move cursor to left-most position
CR	0D	move cursor to left-most position
ESC [R	1B 5B 52	move cursor to right-most position
ESC [K	1B 5B 4B	move cursor to bottom position
ESC l x y	1B 6C x y 1<=x<=20,y=1,2	move cursor to specified position
ESC @	1B 40	initialize display
ESC W s x1 x2 y	1B 57 1 x1 x2 y 1<=x1<=x2<=20 y=1,2	set or cancel the window range at horizontal scroll mode
CLR	0C	clear display screen , and clear string mode
CAN	18	clear cursor line, and clear string mode
ESC * n	1B 2A n 1<=n<=4	brightness adjustment
ESC & s n m [a (p1..pa)]x (m-n+1)	1B 26 1 n m [a(p1..pa)]x (m-n+1) 20<n<=m<=FF	define download characters. a=1-5 p1..p5 =row1..row5
ESC ?	1B 3F	delete download characters.
ESC %	1B 25	select/cancel download character set.
ESC _ n	1B 5F n n=0,1	set cursor ON/OFF
ESC f n	1B 66 n	select international fonts set
ESC c n	1B 63 n	select fonts ,ASCII code or JIS code
ESC = n	1B 3D n n=1,2,3,31,32,33	select peripheral device, Display or Printer
ESC s 1	1B 73 01	store the user defined characters into EEPROM
ESC d 1	1B 64 01	download the user defined characters from EEPROM

Table 6-1

Note: While using command "ESC QA" or "ESC QB", these two commands could be used in conjunction with terminal printer models: TP 2688.or TP3688

* If using commands "ESC QA" or "ESC QB", other commands can not be used except using command "CLR" or "CAN" to change the operating mode.

- If using commands "ESC QD", the upper line message will move continuously until it receives a new command then will clear the upper line and move the cursor to upper line left-most position.

Set international font set (Table 6-2)

n	International font set	n	international font set
A	U.S.A.	N	NORWAY
G	GERMANY	W	SWEDEN
I	ITALY	D	DENMARK I
J	JAPAN	E	DENMARK II
U	U.K.	L	SLAVONIC
F	FRANCE	R	RUSSIA
S	SPAIN		Reserved

Select code table (Table 6-3)

n	International font set
A	Compliance with ASCII code
J	Compliance with JIS code
R	Compliance with RUSSIA code
L	Compliance with SLAVONIC code
P	PC858
W	WPC1252

6.2 UTC standard mode command list

Command	**Code description (hex)**	**Function description**
BS	08	back space
HT	09	horizontal tab
LF	0A	line feed
CR	0D	carriage return
DLE	10	display position
DC1	11	over write display mode
DC2	12	vertical scroll mode
DC3	13	cursor on
DC4	14	cursor off
ESC d	1B 64	change to UTC enhanced mode
US	1F	clear display

Table 6-4

6.3 UTC enhanced mode command list

Command	**Code description (hex)**	**Function description**
ESC u A ....CR	1B 75 41 [data x 40]0D	upper line display
ESC u B ....CR	1B 75 42 [data x 40]0D	bottom line display
ESC u D ....CR	1B 75 44 [data x 40]0D	upper line message scroll continuously
ESC u E ....CR	1B 75 45 hh ‘:’ mm 0D h,m=‘0’-‘9’	display time
ESC u F ....CR	1B 75 46 [data x 40]0D	upper line message scroll one pass
ESC u H ....CR	1B 75 48 n m 0D 20h<=n,m	change attention code
ESC u I ....CR	1B 75 49 [data x 40]0D	two line display
ESC RS ....CR	1B 0F 0D	change to UTC standard mode

Table 6-5

6.4 AEDEX mode command list

Command	Code description (hex)	Function description
! # 1 ....CR	21 23 31 [data x 40]0D	upper line display
! # 2 ....CR	21 23 32 [data x 40]0D	bottom line display
! # 4 ....CR	21 23 34 [data x 40]0D	upper line message scroll continuously
! # 5 ....CR	21 23 35 hh ':' mm 0D h,m='0'-'9'	display time
! # 6 ....CR	21 23 36 [data x 40]0D	upper line message scroll one pass
! # 8 ....CR	21 23 38 n m 0D 20h<=n,m	change attention code
! # 9 ....CR	21 23 39 [data x 40]0D	two line display

Table 6-6

6.5 ADM787/788 mode command list

Command	Code description (hex)	Function description
CLR	0C	clear display
CR	0D	carriage return
SLE1	0E	clear up line and move cursor to upper line left most position
SLE2	0F	clear low line and move cursor to lower line left most position
DC0	10 n	set period to upper line last n position 31H<=n<=37H
DC1	11 n	set line blanking , n='1' up line, n='2' low line
DC2	12 n	clear line blanking , n='1' up line, n='2' low line
SF1	1E	clear field 1 and move cursor to field 1 fast position
SF2	1F	clear field 2 and move cursor to field 2 fast position

Table 6-7

6.6 DSP-800 mode command list

Command	Code description (hex)	Function descriptions
EOT SOH I n ETB	04 01 49 n 17	select international character set.
EOT SOH P n ETB	04 01 50 n 17 n=31-58	move cursor to specified position.
EOT SOH C n m ETB	04 01 43 n m 17 31<= n<=m<=58	clear display range from **n** position to **m** position and move cursor to **n** position.
EOT SOH S n ETB	04 01 53 n 17 n=31-35	save the current displaying data to **n** layer for demo display.
EOT SOH D n m ETB	04 01 44 n m 17 n=31-4F m=31-33	display the saved data
EOT SOH A n ETB	04 01 41 n 17 n=31-34	brightness adjustment.
EOT SOH F n ETB	04 01 46 n 17 00<=n<=FF	flash display screen.
EOT SOH & n [px5] ETB	04 01 26 n p1...p5 17, 20<=n	define download characters
EOT SOH ? n ETB	04 01 3F n 17 20<=n	delete downloaded characters.
EOT SOH = n ETB	04 01 3D n 17 n=‘1’ ,‘2’	select peripheral device. n=‘1’,printer n=‘2’,display
EOT SOH % ETB	04 01 25 17	initialize display
EOT SOH @ ETB	04 01 40 17	execute self-test

Table 6-8

Layer table for saving display data (Table 6-9)

N	Layer select	n	Layer select
bit 0=1	layer 1	bit 3=1	layer 4
bit 1=1	layer 2	bit 4=0	layer 5
bit 2=1	layer 3		

m	show mode
bit 0=1	show mode 1
bit 1=1	show mode 2

6. 7 EPSON Esc/pos command list

Command	Code description(hex)	Function description
HT	09	move cursor right.
BS	08	move cursor left.
US LF	1F 0A	move cursor up.
LF	0A	move cursor down.
US CR	1F 0D	move cursor to right-most position.
CR	0D	move cursor to left-most position.
HOM	0B	move cursor to home position.
US B	1F 42	move cursor to bottom position.
US $ x y	1F 24 x y x=1-20,y=01,02	move cursor to specified position.
CLR	0C	clear display screen.
CAN	18	clear cursor line.
US X n	1F 58 n 01<=n<=04	brightness adjustment.
US E n	1F 45 n n=00-ff	blink display screen.
ESC @	1B 40	initialize display.
ESC t n	1B 74 n n=00-0f	select character code table.
ESC R n	1B 52 n n=00-0f	select international character set.
US r n	1F 72 n n=00,01	select/cancel reverse character.
US MD1	1F 01	specify overwrite mode.
US MD2	1F 02	specify vertical scroll mode.
US MD3	1F 03	specify horizontal scroll mode.
ESC & s n m [a(p1..pa)]x m-n	1B 26 1 n m [a(p1..pa)]x m-n 20<n<=m<=ff	define download characters. 20<n<=m<=ff a=1-5 p1..p5 =row1..row5
ESC ?	1B 3F 20 n FF	delete download characters.
ESC %	1B 25	select/cancel downloaded character set.

EPSON Esc/pos command list (continued)

Command	Code description(hex)	Function description
ESC W n s x1 y1 x2 y2	1B 57 n s x1 y1 x2 y2 n=1,2,3,4 s=0,1	specify / cancel the window range. 1<=x1<=x2<=20 1<=y1<=y2<=2
ESC = n	1B 3D n n=1,31 ,select printer n=2,32 ,select display	select peripheral device.
US :	1F 3A	set starting/ending position of macro definition.
US ^ n m	1F 5E n m 00<=(n, m)<=ff	execute and quit macro.
US @	1F 40	execute a self-test.
US T h m	1F 54 h m 0<=h<=17 , 0<=m<=3b	display time
US U	1F 55	display time continuously
ESC s 1	1F 73 01	store define download character to EEPROM
ESC d 1	1F 64 01	Restore user define character from EEPROM

Table 6-10

CD5220 customer display

Set international font set for ESC/pos

n	International font	n	International font
0	U.S.A.	7	SPAIN
1	FRANCE	8	JAPAN
2	GERMANY	9	NORWAY
3	U.K.	10	DENMARK II
4	DENMARK I	11	SLAVONIC
5	SWEDEN	12	RUSSIA
6	ITALY	15	Reserved

Table 6-11

Select code table for ESC/pos

n	International font set (80H-FFH)
0	Page 0,(PC437:U.S.A.,standard Europe)
1	Page 1,(Katakana for Japan)
2	Page 2,(PC850:multilingual)
3	Page 3,(PC860:Portuguese)
4	Page 4,(PC863:Canadian-French)
5	Page 5,(PC865:Nordic)
6	Page 6,(SLAVONIC)
7	Page 7,(RUSSIAN)
19	Page 8,(PC858:Euro)
16	Page 9,(WPC1252)

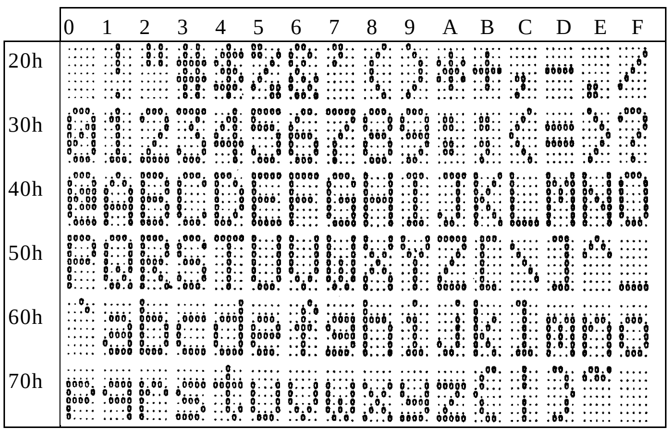
Table 6-12

7. CHARACTER SET

A. Control code set

HEX	CODE	HEX	CODE
00H	NULL	10H	DLE
01H	MD1	11H	DC1
02H	MD2	12H	DC2
03H	MD3	13H	DC3
04H	MD4	14H	DC4
05H	MD5	15H	
06H	MD6	16H	
07H	MD7	17H	
08H	BS,MD8	18H	CAN
09H	HT	19H	
0AH	LF	1AH	
0BH	HOM	1BH	ESC
0CH	CLR	1CH	
0DH	CR	1DH	
0EH	SLE1	1EH	SF1
0FH	RS,SLE2	1FH	US,SF2

B. U.S.A font set

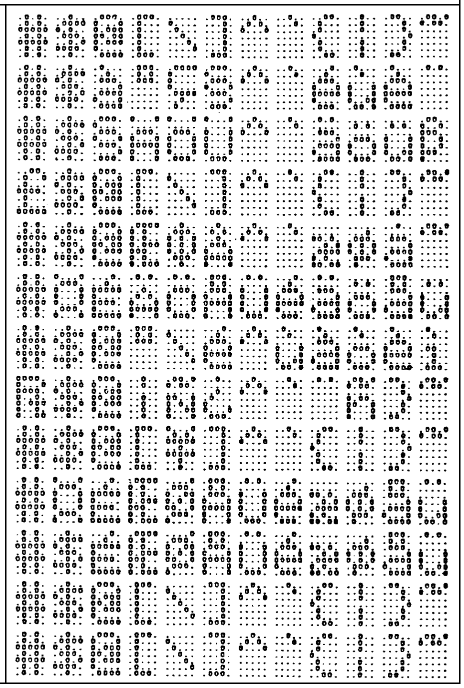


C. International character selection (Indicated character selection by dip switch or command)

ASCII CODE

NO.	International
0	USA
1	FRANCE
2	GERMANY
3	U.K.
4	DENMARK I
5	SWEDEN
6	ITALY
7	SPAIN
8	JAPAN
9	NORWAY
10	DENMARK II
11	SLAVONIC
12	RUSSIA

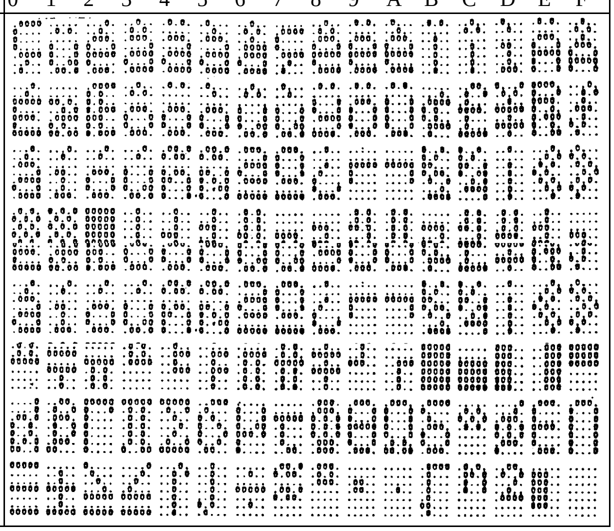
Columns: 23 24 40 5B 5C 5D 5E 60 7B 7C 7D 7E



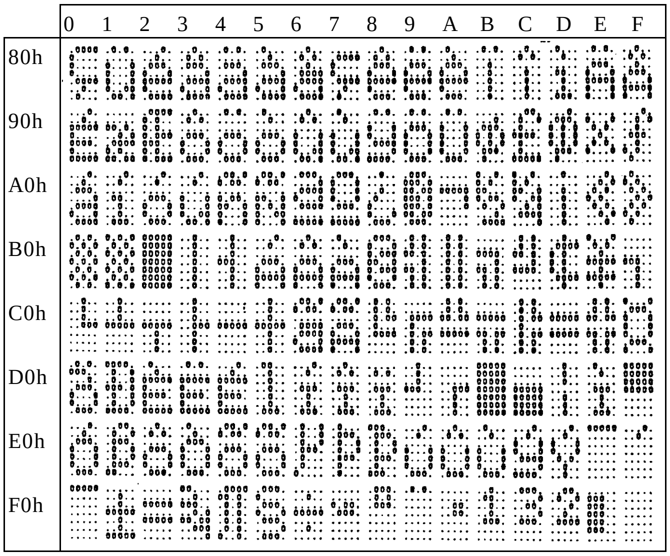
D. PC-437 Standard Europe international font set

Columns: 0 1 2 3 4 5 6 7 8 9 A B C D E F

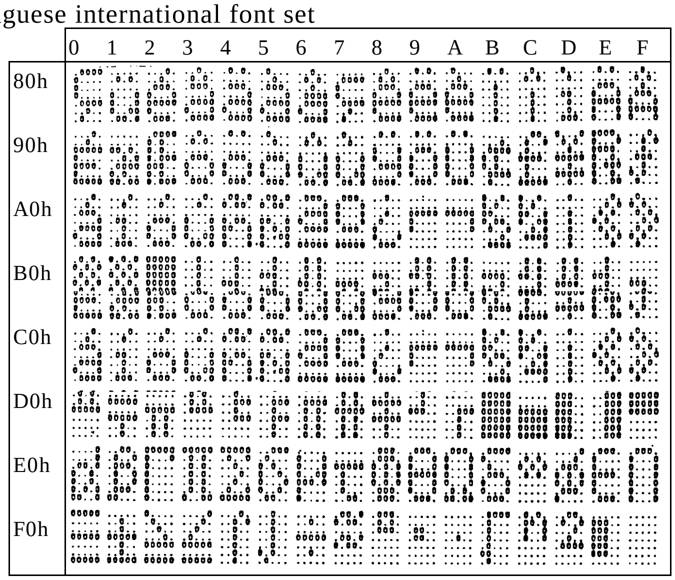
Rows: 80h 90h A0h B0h C0h D0h E0h F0h



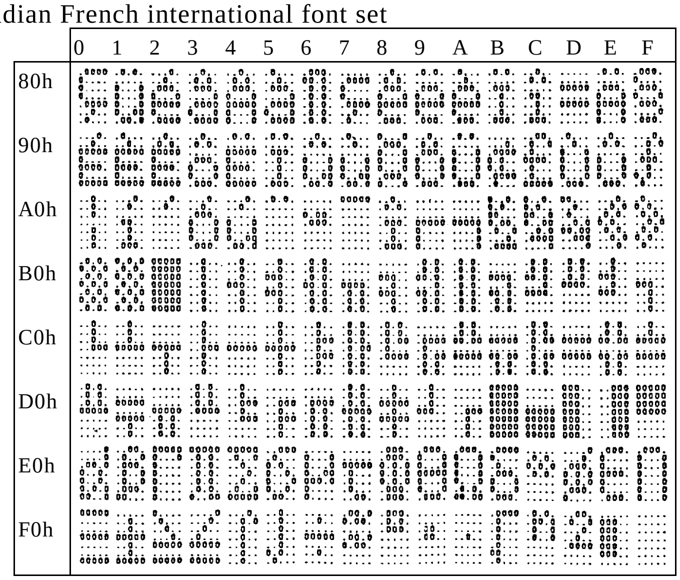
E. PC-850 Multilingual international font set



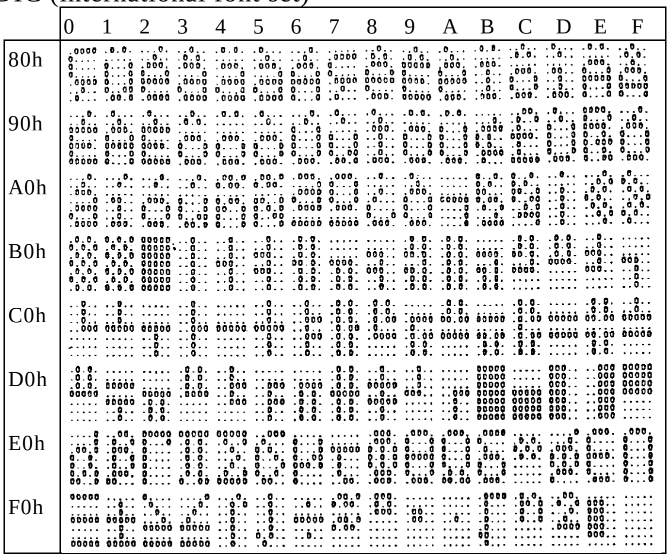
F. PC-860 Portuguese international font set



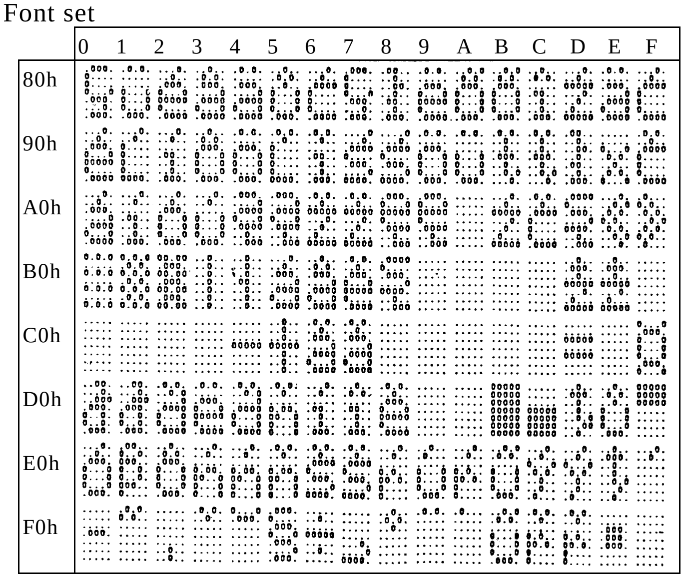
G. PC-863 Canadian French international font set



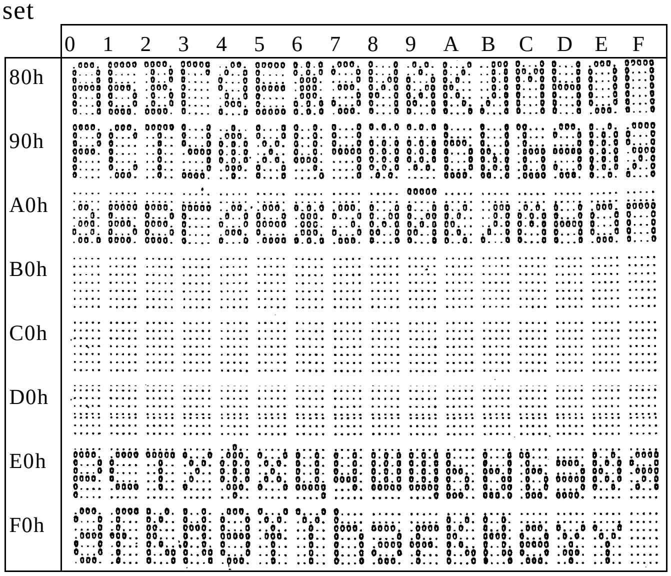
H. PC-865 NORDIC (international font set)



I. SLAVONIC Font set

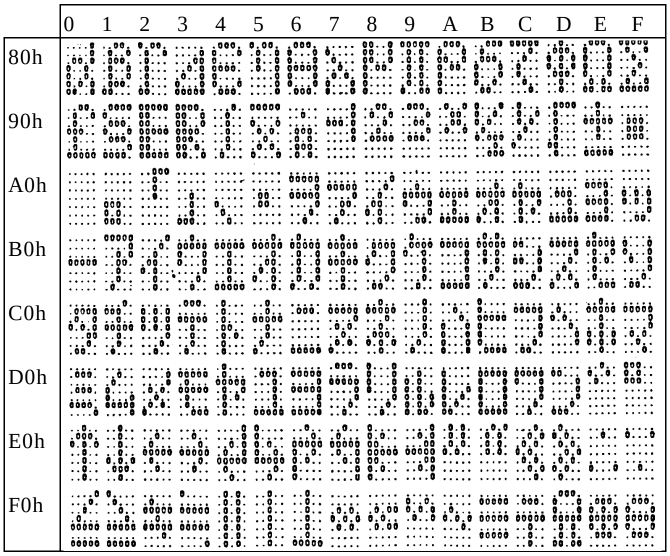


J. RUSSIA font set



CD5220 customer display

K. Katakana font set



L. PC-858

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h																
90h																
A0h																
B0h																
C0h																
D0h																
E0h																
F0h																

M. WPC1252

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
80h																
90h																
A0h																
B0h																
C0h																
D0h																
E0h																
F0h																

8. INSTALLATION GUIDE

